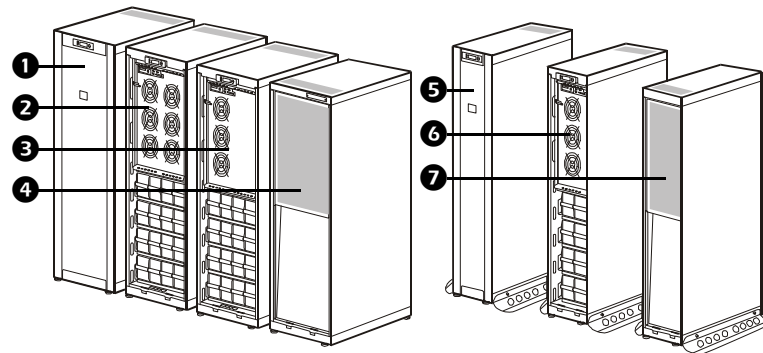




## Installation

### Smart-UPS<sup>®</sup> VT 10-40 kVA 380/400/415 V with batteries



- ❶ 10-40 kVA
- ❷ 20-40 kVA without front panel
- ❸ 10-15 kVA without front panel
- ❹ 10-40 kVA from the rear
- ❺ 10-20 kVA
- ❻ 10-20 kVA without front panel
- ❼ 10-20 kVA from the rear

## IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS



**Warning:** ALL safety instructions in the Safety Sheet (990-2822) must be read, understood, and followed when installing the UPS system. Failure to do so could result in equipment damage, serious injury, or death.



**Warning:** After the UPS has been electrically wired, do not start it up. Start-up is commissioned to APC-authorized personnel only.



**Caution:** All electrical power and power control wiring must be installed by a qualified electrician, and must comply with local and national regulations for maximum power rating.



**Note:** Ensure that the unit is in its final location prior to installation.



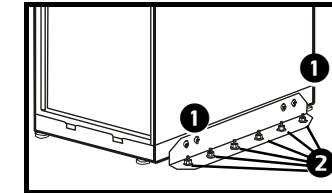
**Note:** Battery and utility/mains power must not be connected until all other wiring has been completed.

## Floor Anchoring (if applicable)

### Anchor the UPS enclosure to the floor



**Note:** Floor-anchoring bolts are not provided with the UPS. Purchase the bolts locally (minimum size: M8). Follow the specifications given by the manufacturer of the floor anchoring system when bolting the UPS system to the floor.

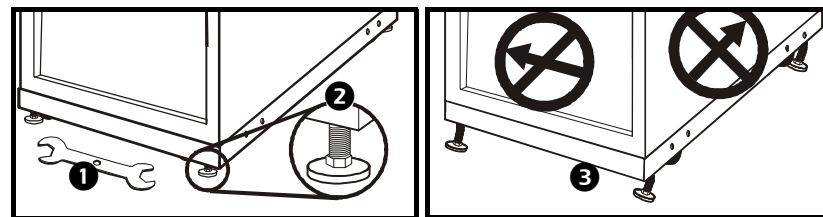


- ❶ Reuse the two transport brackets (one on each side) that were used to secure the UPS to the pallet during transport.
- ❷ Drill two to six holes in the floor for each bracket. Attach with bolts.

## Level the Enclosure



**Warning:** The system must be installed on a level floor. The leveling feet will stabilize the enclosure, but will not account for a badly sloped floor.



- ❸ Use a 13/14 mm wrench to adjust the four leveling feet.
- ❹ Ensure that the system is level.

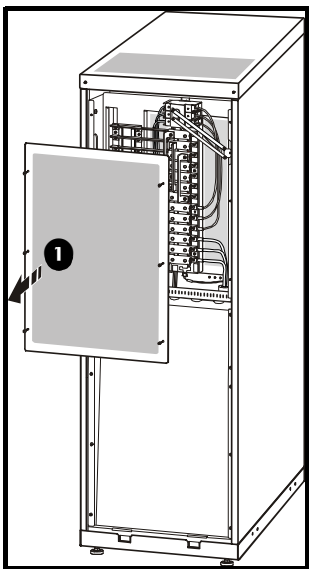


**Caution:** Do not move the enclosure after the leveling feet have been lowered.

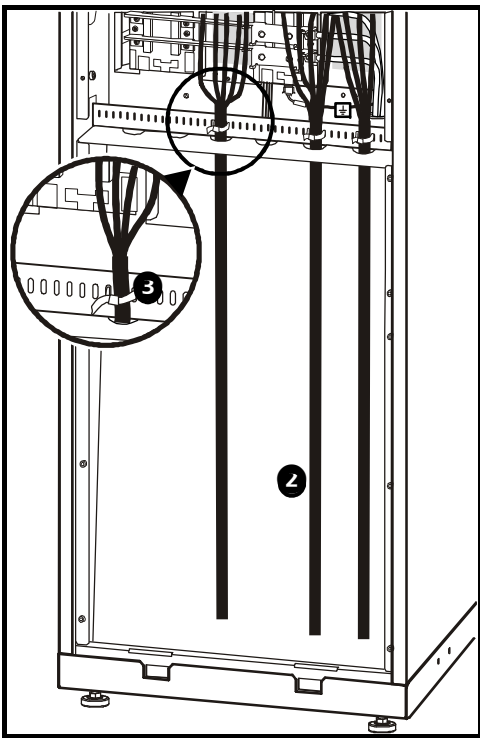


# Prepare for Cables

## Bottom cable entry



- ❶ From the rear of the UPS, loosen the six M4 screws from the upper cover (the cable landing area) on the back and remove.



- ❷ Route the cables from the slanted back plate, up through the punched bracket, and into the cable landing area.

- ❸ Fasten the cables with cable ties



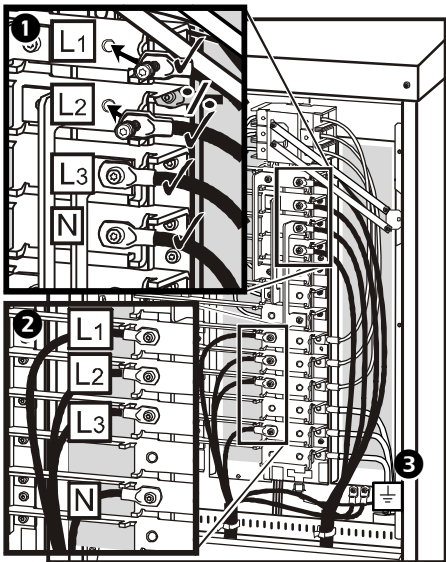
**Note:** A conduit box (part no. SUVTOPT001) is available as an option.

# Connect the AC Input and AC Output Cables



**Warning:** Use compression type lugs **ONLY**. Do not loosen or add cables to any factory preinstalled cables on busbars. Use the front part of busbar for connection only.

## Single mains

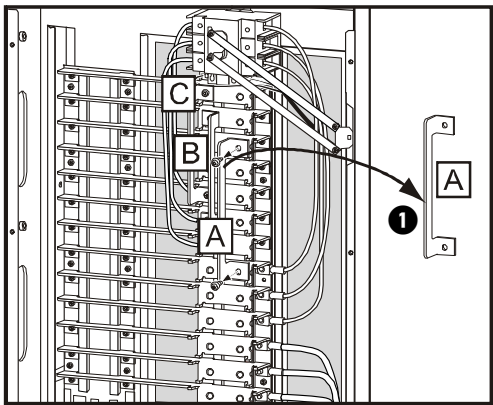


- ❶ Connect the AC input cables and the neutral to the input cable landings.

- ❷ Connect the AC output cables and the neutral to the output cable landings.

- ❸ Connect the ground cables to the studs (earth symbol beneath) using a screw.

## Dual mains



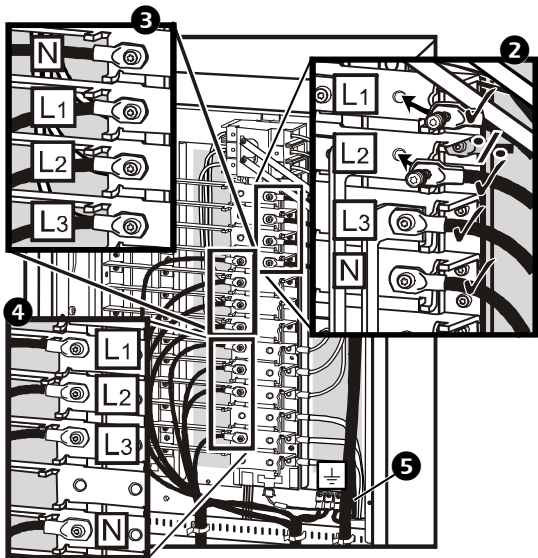
- ❶ Remove the three busbars A, B, and C by removing two M6 screws from each busbar.

- ❷ Connect the AC input cables and the neutral to the input cable landings.

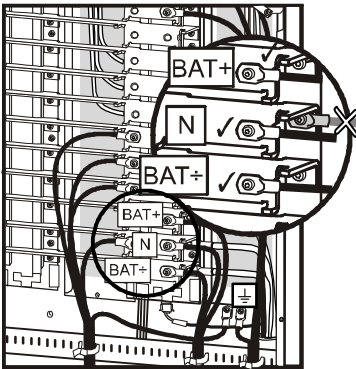
- ❸ Connect the bypass cables and the neutral to the bypass cable landings.

- ❹ Connect the output cables and the neutral to the output cable landings.

- ❺ Connect the ground cables to the studs (earth symbol beneath) using a screw.



# Connect the DC Battery Cables (if applicable)



1 Connect battery cables BAT+, BAT-, and N to the battery cable landings.



**Note:** ONLY APC Smart-UPS VT XR Battery Enclosure (SUVTRBXR6) must be connected to the UPS.

# Connect the Communication Cables

## J106 and J108 pin connections



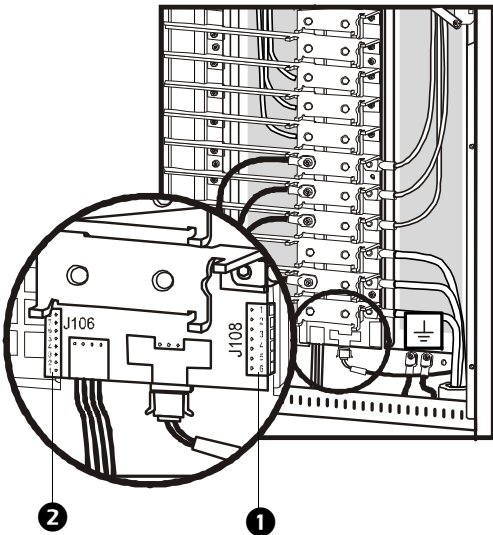
**Note:** The UPS must be connected to either a dry contact or a 24 VDC EPO (Emergency Power Off) switch.



**Note:** The external EPO +24 VDC, 1500 mA circuit can be supplied through other vendors.



**Note:** Always follow the pin connection procedures from the top and work down: J106 (8-1), J108 (1-6).



### 1 J108 pin connections:

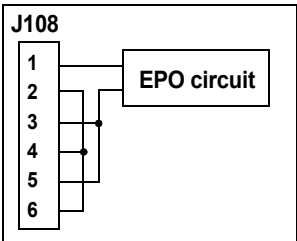
- 1 Normally open EPO
- 2 Normally open EPO return
- 3 Normally closed EPO
- 4 Normally closed EPO return
- 5 +24 V SELV supply
- 6 SELV ground

### 2 J106 pin connections:

- 8 Ext. charging control return
- 7 External control of charging
- 6 Q3 active return
- 5 Q3 active
- 4 Battery measurement supply\*
- 3 Battery unit quantity\*
- 2 Max. battery temperature\*
- 1 Battery measurement return\*

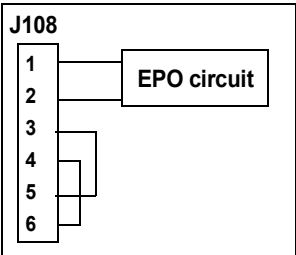
\* Should be used with APC XR Enclosures

**EPO wiring – pin connections J108.** Connect the EPO cable, using one of the following four wiring configurations.



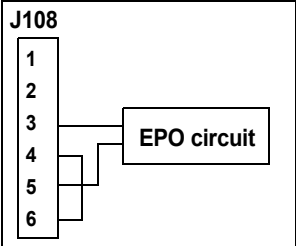
### 1: Dry Contracts Normally Open

EPO is activated when pin 1 is connected to pins 3 and 5.  
Connections: 2-4-6, 3-5 and 1 =>



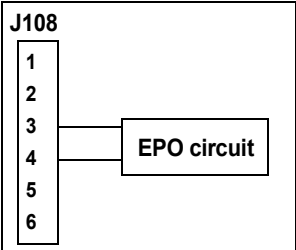
### 2: +24 V Normally Open

EPO is activated when an isolated SELV 24 VDC voltage is supplied on pin 1 with reference to pin 2.  
Connections: 3-5 and 4-6.



### 3: Dry Contacts Normally Closed

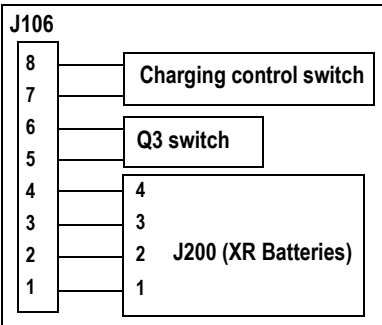
EPO is activated when a connection from pin 3 to pin 5 is opened.  
Connections: 4-6.



### 4: +24 V Normally Closed

EPO is activated when a SELV 24 VDC voltage is removed from pin 3 with reference to pin 4.

## Pin connections J106 (UPS).



Pins 1 to 4 are for battery measurement (only applicable to APC XR Battery Enclosures).

Pins 5 and 6 are for external maintenance bypass Q3 (auxiliary switch N/C type). When Q3 is closed, signals are fed back to the UPS controller.

Pins 7 and 8 are for external charge control. When 7 and 8 are closed, the UPS charges batteries with a pre-defined percentage (0-25-50-75-100%) of the maximum charging power. To be used in generator applications, or if special codes require control of charging. When Q3 is closed, signals are fed back to the UPS controller.



**Note:** When connecting the Q3 auxiliary signal, use gold-plated N/C auxiliary switch.



**Note:** Reinstall the cable landing cover.

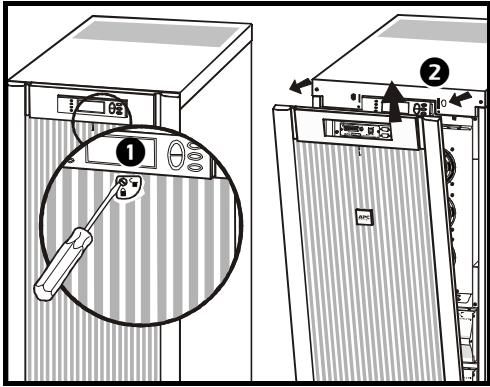
Connect APC communication options



**Note:** The cable routing of the power chute software and the temperature sensor is identical.

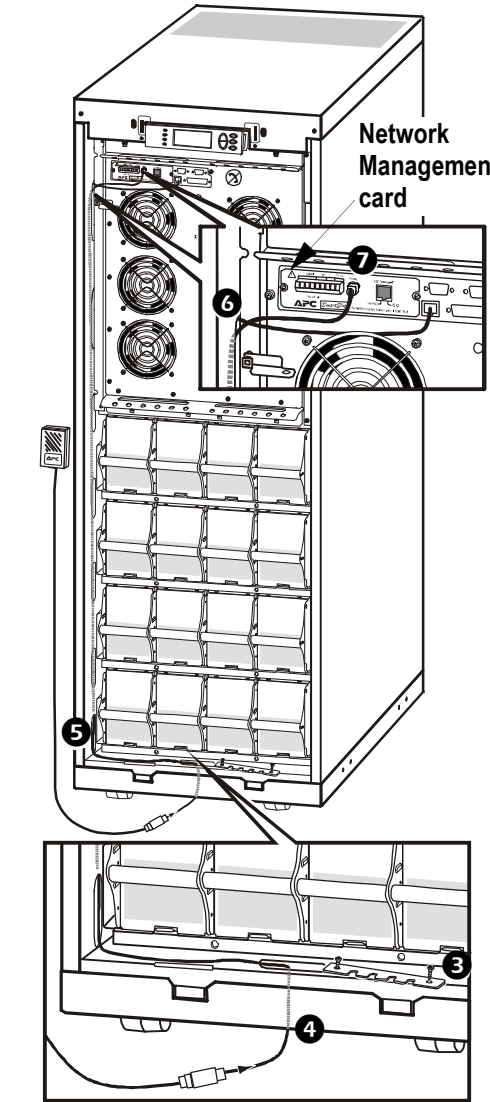


**Note:** The temperature sensor is provided in a plastic bag attached to the front of the UPS behind the front panel.



❶ Turn the screw below the user interface display to the right to the unlocked position.

❷ Lift the front panel to free the two tabs at the bottom of the enclosure.



❸ Remove the two screws from the cable-inlet at the front and remove the cable-inlet plate.

❹ Guide the cable through the hole in the bottom plate and up through the cable-inlet.

❺ Guide the cable through the side panel hole and run the cable upwards inside the panel.

❻ Pull the cable out of the side panel through the hole closest to the Network Management Card area.

❼ Plug the cable into the probe socket / PowerChute inlet.

❽ Reattach the cable-inlet plate (❸).

Specifications



**Warning:** The UPS must be supplied from a 380/220 V, 400/230 V or 415/240 V L1, L2, L3, N, PE, 50 Hz.

AC input

UPS ratings	10 kVA		
	380 V	400 V	415 V
Input frequency (Hz)	40-70	40-70	40-70
Nominal input current (A) <sup>1</sup>	13.0	12.3	11.9
Max. input current (A) <sup>2</sup>	14.3	13.5	13.1
Input current limit (A) <sup>3</sup>	16.8	16.8	16.8

<sup>1</sup> Input current based on rated load and batteries fully charged.  
<sup>2</sup> Input current based on fully battery recharge, nominal voltage and rated load.  
<sup>3</sup> Current limitation through electronic current limiting is based on full battery recharge and -15% input voltage.

UPS ratings	15 kVA			20 kVA		
	380 V	400 V	415 V	380 V	400 V	415 V
Input frequency (Hz)	40-70	40-70	40-70	40-70	40-70	40-70
Nominal input current (A) <sup>1</sup>	19.4	18.5	17.8	26.0	24.7	23.8
Max. input current (A) <sup>2</sup>	21.4	20.3	19.6	28.6	27.2	26.2
Input current limit (A) <sup>3</sup>	25.2	25.2	25.2	33.8	33.8	33.8

<sup>1</sup> Input current based on rated load and batteries fully charged.  
<sup>2</sup> Input current based on fully battery recharge, nominal voltage and rated load.  
<sup>3</sup> Current limitation through electronic current limiting is based on full battery recharge and -15% input voltage.

UPS ratings	30 kVA			40 kVA		
	380 V	400 V	415 V	380 V	400 V	415 V
Input frequency (Hz)	40-70	40-70	40-70	40-70	40-70	40-70
Nominal input current (A) <sup>1</sup>	38.6	36.7	35.3	51.7	49.1	47.3
Max. input current (A) <sup>2</sup>	42.5	40.3	38.9	56.8	54.0	52.1
Input current limit (A) <sup>3</sup>	50.1	50.1	50.1	66.9	66.9	66.9

<sup>1</sup> Input current based on rated load and batteries fully charged.  
<sup>2</sup> Input current based on fully battery recharge, nominal voltage and rated load.  
<sup>3</sup> Current limitation through electronic current limiting is based on full battery recharge and -15% input voltage.

AC output

UPS ratings	10 kVA		
	380 V	400 V	415 V
Nominal output current (A)	15.2	14.4	13.9

UPS ratings	15 kVA			20 kVA		
	380 V	400 V	415 V	380 V	400 V	415 V
Nominal output current (A)	22.8	21.7	20.9	30.4	28.9	27.8

UPS ratings	30 kVA			40 kVA		
	380 V	400 V	415 V	380 V	400 V	415 V
Nominal output current (A)	45.6	43.3	41.7	60.8	57.7	55.6

Battery input

UPS ratings	15 kVA	15 kVA	20 kVA	30 kVA	40 kVA
Nominal voltage (V)	± 192	± 192	± 192	± 192	± 192
External battery fuse (A)	125	125	125	125	125
125	1.6-1.75 V/cell (automatic, depending on load)				

Bypass input

	10 kVA					
UPS ratings	380 V	400 V	415 V	380 V	400 V	415 V
Input frequency (Hz)				50-60	50-60	50-60
Nominal input current (A) <sup>1</sup>				13.0	12.3	11.9
<sup>1</sup> Input current based on rated load and batteries fully charged.						

	15 kVA			20 kVA		
UPS ratings	380 V	400 V	415 V	380 V	400 V	415 V
Input frequency (Hz)	50-60	50-60	50-60	50-60	50-60	50-60
Nominal input current (A) <sup>1</sup>	19.4	18.5	17.8	26.0	24.7	23.8
<sup>1</sup> Input current based on rated load and batteries fully charged.						

	30 kVA			40 kVA		
UPS ratings	380 V	400 V	415 V	380 V	400 V	415 V
Nominal voltage (V)	50-60	50-60	50-60	50-60	50-60	50-60
Nominal input current (A) <sup>1</sup>	38.6	36.7	35.3	51.7	49.1	47.3
<sup>1</sup> Input current based on rated load and batteries fully charged.						

Recommended current protection



**Note:** AC input/output over-current protection and AC input/output disconnect must be provided by the customer

	Q1 <sup>1</sup>	Q5 <sup>2</sup>	Q3	Q2
10 kVA	16	16	16	16
15 kVA	25	25	25	25
20 kVA	35	35	35	35
30 kVA	50	50	50	50
40 kVA	63	63	63	63
<sup>1</sup> Required upstream current protection, mains input: gL type fuse.				
<sup>2</sup> Required upstream current protection, bypass input: gL type fuse.				

Recommended cable sizes



**Note:** The recommended cable sizes are based on an environment with an ambient temperature of 30°C.

	Mains input [mm²]	AC output [mm²]	Battery input [mm²] 70°C Wire	Bypass input [mm²]
10 kVA	2.5	2.5	6	2.5
15 kVA	6	6	10	6
20 kVA	10	10	16	10
30 kVA	16	16	35	16
40 kVA	25	25	50	25



**Note:** Use Molex lug type or equivalent, and crimp to manufacturer’s specifications.



**Warning:** At 100% switch mode load, the neutral must be rated for 200% phase current.

Minimum breaker settings

	Internal fault <sup>1</sup>	800% overload bypass operation	150% overload normal/ battery operation	125% overload normal/ battery operation	Conti- nuously
10 kVA					
Mains input	2 kA	–	–	–	16.4 A
Bypass input	1.7 kA	121.5 A	–	–	16.7 A
Output	9 kA	121.5 A	22.8 A	19 A	16.7 A
Duration	<10 ms	500 ms	10 s	10 min.	∞
15 kVA					
Mains input	2.1 kA	–	–	–	24.6 A
Bypass input	1.8 kA	182 A	–	–	25.1 A
Output	9 kA	182 A	34.2 A	25.4 A	25.1 A
Duration	<10 ms	500 ms	60 s	10 min.	∞
20 kVA					
Mains input	2.5 kA	–	–	–	32.5 A
Bypass input	2.3 kA	244 A	–	–	33.4 A
Output	9 kA	244 A	68.4 A	57 A	33.4 A
Duration	<10 ms	500 ms	60 s	10 min.	∞
30 kVA					
Mains input	2.5 kA	–	–	–	32.5 A
Bypass input	2.3 kA	244 A	–	–	33.4 A
Output	9 kA	244 A	68.4 A	57 A	33.4 A
Duration	<10 ms	500 ms	60 s	10 min.	∞
40 kVA					
Mains input	3 kA	–	–	–	65.6 A
Bypass input	2.3 kA	487 A	–	–	66.9 A
Output	14 kA	487 A	91.2 A	76 A	66.9 A
Duration	<10 ms	500 ms	60 s	10 min.	∞
<sup>1</sup> For the output value, the short-circuit level is indicated.					

Recommended lug size and torque value



**Note:** Power terminal lug diameter: 6 mm. Torque value: 7 Nm.



# Checklist

<input type="checkbox"/>	Check that the power wiring is torqued to 7 Nm.
<input type="checkbox"/>	Verify phase-rotation to the right (L1, L2, L3) and make sure a neutral connection is present.
<input type="checkbox"/>	Leave a wiring diagram on site for service personnel.
<input type="checkbox"/>	Re-install the cable landing cover.
<input type="checkbox"/>	Re-mount the front panel
<input type="checkbox"/>	If XR Battery Enclosures are installed, make sure that all DC breakers (if applicable) are in the OFF position and that both 125 A fuses are removed from the XR Battery Enclosures.

For any optional equipment, refer to the product-specific manuals.

# Contact Information

For local, country-specific centers: go to [www.apc.com/support/contact](http://www.apc.com/support/contact).

# Appendix

## Wiring diagrams

